

Monday, 10/23/2006 12:05:25 PM  
Kim Johnston

Customer	:	CU-DAR001 Dart Helicopters Services	Drawing Name	:	X-TUBE EXTRUSION OH-58
Job Number	:	29110			
Estimate Number	:	10005			
P.O. Number	:	N/A	Part Number	:	D6005128
This Issue	:	10/23/2006	S.O. No.	:	N/A
Prsht Rev.	:	NC	Drawing Number	:	D6005 REV A
First Issue	:	N/A	Project Number	:	N/A
Previous Run	:	26549	Drawing Revision	:	A
			Material	:	N/A
Written By	:	<u>HJ</u>	Due Date	:	1/30/2007
Checked & Approved By	:	<u>HJ 06 10 23</u>	Qty:		13
Comment	:	Est Rev: C 04.06.15 Added tolerance to Step 2	Um:		Each
		KJ/JLM			

## Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	PG	PURCHASING
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**Comment:** PURCHASING

Issue P/O: 2339

a) Order as per Dwg D6005

b) Material: 2.750 x 0.375 wall 7075-T6/T6511 (WW-T-700/7 or QQ-A-225/9 or QQ-A-200/11) seamless aluminum tube

c) Minimum ultimate tensile strength = 77 ksi

d) Minimum tensile yield strength = 66 ksi

e) Tolerance are per ASTM B210 (see details on Dwg D6005)

f) Material certification required

2.0	D6005128P	Crosstube material
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**Comment:** Qty.: 1.0000 Each(s)/Unit      Total : 13.0000 Each(s)

### Crosstube material

3.0	PACKAGING 1	PACKAGING RESOURCE #1
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**Comment:** PACKAGING RESOURCE #1

### Receive & Inspect For Transit Damage

Ensure material certification is attached

4.0 QC6 DIMENSIONAL CHECK



**Comment:** DIMENSIONAL CHECK

Ensure Material certification comply to Dwg D6005

**Dart Aerospace Ltd**

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: RP Date: 07/03/28  
 QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

Date: Monday, 10/23/2006 12:05:25 PM  
User: Kim Johnston

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: X-TUBE EXTRUSION OH-58

Job Number: 29110

Part Number: D6005128

Job Number:



Seq. #:

Machine Or Operation:

Description :

5.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

6.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

7.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: \_\_\_\_\_

MS 07/03/27 14

8.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

14  
07/03/28

Job Completion



U 07-03-28

**Dart Aerospace Ltd**

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

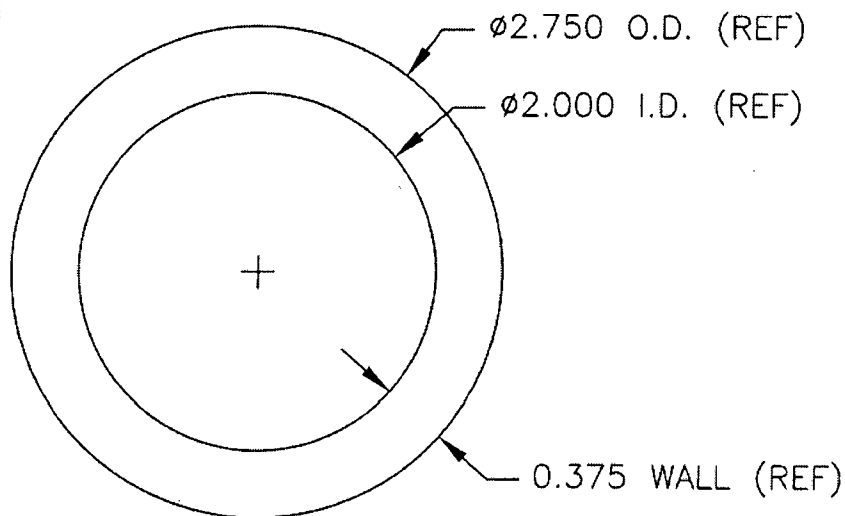
**NOTE:** Date & initial all entries



DESIGN <i>CP</i>	DRAWN BY <i>CP</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>A</i>	APPROVED <i>A</i>	DRAWING NO. D6005	REV. A SHEET 1 OF 1
DATE 00.11.17		TITLE CROSSTUBE MATERIAL	SCALE 1:1
A	00.11.17	NEW ISSUE	

## SPECIFICATION CONTROL DRAWING

**RELEASED**  
00.11.24 *A*



### NOTES

- 1) D6005-XXX CROSSTUBE  
LENGTH

WHERE XXX IS LENGTH IN INCHES  
EG. 128" LONG TUBE: D6005-128

- 2) MATERIAL: 2.750 OD x 0.375 WALL 7075-T6/T6511 (WW-T-700/7 OR QQ-A-200/11) SEAMLESS ALUMINUM TUBE.  
MINIMUM ULTIMATE TENSILE STRENGTH = 77 ksi  
MINIMUM YIELD TENSILE STRENGTH = 66 ksi
- 3) TOLERANCES ARE PER ASTM B210 AS FOLLOWS:  
O.D.:  $\pm 0.006$  MEAN ( $\pm 0.012$  INCLUDING OVALITY)  
WALL:  $\pm 0.015$  MEAN ( $\pm 0.038$  INCLUDING ECCENTRICITY)  
LENGTH: XXX  $+0.125/-0.000$   
STRAIGHTNESS: 0.010" DEVIATION / 12" LENGTH
- 4) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 5) CHEMICAL CONVERSION COAT PER DART QSI 005 4.1

SHOP COPY  
NO. 29110  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 29110

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**invoice**
**31742**

page: 3  
date: 2.16.2007  
customer: 40980

Surface Finish max. RMS 25  
Tolerances per ASTM B210 / your drawing D6003  
Tubes protected with corrosion protective oil  
Tubes line marked  
Packing: seaworthy wooden cases

item	quantity	unit	price USD	unit	value	USD
004	18,000	PC	278,34	PC	5.010,12	

AWU article: 19796 / Tariff no. 76082081  
Customer article: D6004-115 2.500 X 0.350 X 115  
product: TUBES / seamless extruded / EN AW-7075 / round  
condition: T 6511 / AMS-QQ-A-200/11

outer diameter:	63,500 mm	Tol.	+0,300	-0,300
tol. for mean OD			+0,150	-0,150
inner diameter:	45,720 mm			
wall thickness:	8,890 mm	Tol.	+0,890	-0,890
fixed length	2921,000 mm	Tol.	+3,175	

inspection cert. acc. to EN10204/3.1 / RM 531 / Rp0,2: 455  
straightness 0,25 mm / 304,8 mm / RMS outer 25  
tol. on quantity +15 % -15 %  
2.500" OD 0.350" Wall, 115" lengths  
Part Number D6004-115 crosstube  
Surface Finish max. RMS 25  
Tolerances per ASTM B210 / your drawing D6004  
Tubes protected with corrosion protective oil  
Tubes line marked  
Packing: seaworthy wooden cases

item	quantity	unit	price USD	unit	value	USD
005	14,000	PC	375,95	PC	5.263,30	

AWU article: 17954 / Tariff no. 76082081  
Customer article: D6005-128 2.750 X 0.375 X 128  
product: TUBES / seamless extruded / EN AW-7075 / round  
condition: T 6511 / AMS-QQ-A-200/11

outer diameter:	69,850 mm	Tol.	+0,300	-0,300
tol. for mean OD			+0,150	-0,150
inner diameter:	50,790 mm			
wall thickness:	9,530 mm	Tol.	+0,970	-0,970
fixed length	3251,000 mm	Tol.	+3,175	

test report acc. to EN 10204/3.1 / RM 531 / Rp0,2: 455  
straightness 0,25 mm / 304,8 mm / RMS outer 25  
tol. on quantity +15 % -15 %  
2.750" OD 0.375" Wall, 128" lengths

# Abnahmeprüfzeugnis 3.1 - EN 10204:2004

Inspection Certificate 3.1 - EN 10204:2004 / Certificat de Reception 3.1- EN 10204:2004

**Kunde:** Dart Aerospace Ltd.  
**Client:**

1270 Aberdeen Street  
K6A1K7 Hawkesbury, ON Canada

**Zeugnisnummer:** 155/07  
**Cert No. / No. du certificat:**  
**Bestellnummer:** PO 00002339  
**Order No. / No. de commande**  
**Auftrag:** 21531/5  
**Our Reference/Notre Reference:**

**Produkt:** Rohre nahtlos gepresst  
**Product / Produit:** Tubes seamless extruded

**Spezifikation:** AMS - QQ - A - 200/11E; Spezifikation Dart Aerospace 6005  
**Specification:**

**Werkstoff:** 7075  
**Alloy/Alliage:**

**Zustand:** T 6511  
**Temper/État**

**Abmessung:** 2,750 INCH x 2,000 INCH x 0,375 INCH x 128,000 INCH  
**Size / Dimension:** D6005-128 2.750 x 0.375 x 128

**Kennzeichnung:** ALUnna - Cert No. 155/07 - 7075 - T 6511 - Cast No. 80006 - AMS - QQA 200/11 - 2.750" OD X 0.375" Wall - Heat  
**Marking/Marquage:** No. 912/01 - Lot 21531/5-1 PO. 00002339

**Lieferung:** pcs. lbs **Country of Manufacture: Germany**  
**Delivered Material / Matériel délivré:** 14 511

## 1. Chemische Analyse

## Chemical Analysis / analyse chimique

Charge/ Cast No.	min. max.	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Pb	Zr	Bi	Sn	Ni
		0,40	0,50	1,2 2,0	0,30	2,1 2,9	0,18 0,28	5,1 6,1	0,20					
80006		0,096	0,178	1,37	0,031	2,48	0,183	5,82	0,037	0,004	0,014	0,001	0,001	0,0001

**Hydrogen content:** 0,10 ccm/100 g Al

Elements without indication < 0,01 %

## 2. Mechanische Eigenschaften

## Mechanical Properties / Valeurs Mécaniques

Anforderungen Requirements	tensile (Rm) ksi	yield (Rp0,2) ksi	elongation 2" %	elongation A %	Hardness HB	Heat No.
	min. max.					
1	77,0 84,970	66,0 78,300	10,0		166	912/01 - 14 pcs.

RMS outside 25 - max. 13,7 µ"

### Ergebnis der Prüfungen:

Es wird bestätigt, daß die Lieferung geprüft wurde und den Vereinbarungen bei der Bestellannahme entspricht

### Test results:

We confirm that the delivery has been tested and applies to the agreements made on receipt of the order

### Resultats:

Nous confirmons que la livraison a été contrôlée et correspond avec les conventions faites à la réception de la commande

KroosD



Certified acc. to DIN EN ISO 9001:2000, valid until 2009-03-27  
Certificate No.: 001959 QM



ALUnna

Abnahmebeauftragter

09.02.2007

Aluminiumwerk Unna AG, Uelzener Weg 36, 59425 Unna, Germany

## Packinglist ALUnna AG

Customer PO	PO. 00002339
ALUnna ref. no.	21531/5
Date:	02.15.07

### Boxmarking:

Dart Aerospace P.O. 00002339
D 5005 - 128 Made in Germany
Dest. Hawkesbury, Canada

**We hereby declare that the wooden packing material are totally free from bark and apparently**

**free from live plant pests**

free from live plant pests										Boxdimension		
Item no.	Box no.	OD (inch)	ID (inch)	Wall (inch)	Net Weight (lbs)	Tare lbs	Gross Weight	Pieces	lengths (ft)	Lengths (inch)	Width (inch)	height (inch)
5	1	2,750	2,000	0,375	511	229	741	14	11	151,575	22,047	22,441
					511	229	741	14		1,229 m³		